and n the normal state. For F(T) a formula extending over several lines is given. In a diagram (Fig 1) the data measured by Sladek for In-Tl-alloy (Ref 3) for κ_s/κ_n as well as the curve calculated by the authors are plotted. Agreement is good. For $T \rightarrow 0$ the curve shows an exponential increase of the κ_p-values. In the following various relations between κ_e, κ_p and κ_{pe} (in connection with phonon-electron scattering) and κ_{pd} (in connection with phonon-lattice defect scattering) are discussed. Sound absorption in electronic excited superconductors shows that in the case in which the sound frequency is $\omega \gg 1/\tau$ (τ= relaxation time) there is no deviation from that in normal metals. For the ratio between sound quantum absorption and -emission a formula is finally given. The authors in conclusion thank Academician L. D. Landau for his valuable advice. There are 2 figures and 13 references, 5 of which are Soviet.

On the Thermal Conductivity and Sound Absorption in Superconductors SOV/56-36-3-66/71

ASSOCIATION: Moskovskiy gosudarstvennyy pedagogicheskiy institut (Moscow Pedagogical Institute)

SUBMITTED: December 18, 1958

Card 3/3

24(8),24(1)

AUTHOR: Kresin, V. Z.

SOV/56-36-6-58/66

TITLE: On the Problem of the Thermal Conductivity and the Absorption of Sound in Superconductors (K voprosu o teploprovodnosti i pogloshchenii zvuka v sverkhprovodnikakh)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 6, pp 1947-1948 (USSR)

ABSTRACT: The absorption of sound in superconductors is investigated for the case in which $\omega\tau \ll 1$ (ω - sound frequency, τ - relaxation period). The absorption of sound energy is due to the irreversibility of lattice deformation. The solution of the equations of motion for the distribution function of the electronic excitations of the superconductor, which interact with phonons, and the following calculation of the dissipative function determining the absorption of sound energy leads to the following result for the sound absorption coefficient γ_s: $\gamma_s = 4\gamma_n(e^b + 1)^{-2}F(T_k)/F(T)$. $\gamma_n = \text{const}.T^{-5}$ is the sound absorption coefficient in normal metal (according to Akhiyezer)(Ref 1), $b = \Delta/kT$, Δ - the energy spectrum slit. $F(T)$ is a complex function of b, s, and $\zeta(s)$, $\zeta(s)$ is the zeta

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function. A figure shows the course of the curve $F(T)/F(T_k)$ in dependence on Δ/kT. In a similar manner it is possible to calculate the influence exercised by electron-photon interaction upon the electron-dependent thermal conductivity in superconductors (cf Geylikman), (Ref 2). A formula for the thermal conduction coefficient is given (cf also Landau and Pomeranchuk)(Ref 3). The author finally thanks B. T. Geylikman for suggesting the subject and for his valuable advice. There are 1 figure and 3 Soviet references.

ASSOCIATION: Moskovskiy gosudarstvennyy pedagogicheskiy institut (Moscow Pedagogical State Institute)

SUBMITTED: March 19, 1959

83203
S/056/60/039/002/040/044
B006/B070

24.7600

AUTHORS: Geylikman, B. T., Kresin, V. Z.

TITLE: Thermo-magnetic Effects in Superconductors

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 2(8), pp. 502 - 503

4

TEXT: The purpose of the present paper was to show that the coefficient of the Leduc-Righi effect remains unaltered when a metal passes from the normal to the superconducting state. For the study of thermo-magnetic effects in semiconductors, an equation of motion for the distribution function of the electron excitations is commonly used. The authors derive it in the form $-\frac{\partial f}{\partial \varepsilon}\frac{\varepsilon}{T}v_x\frac{\partial T}{\partial x}+\frac{eH}{c}\left(v_y\frac{\partial f}{\partial p_x}-v_x\frac{\partial f}{\partial p_y}\right)\frac{\xi}{|\xi|}=-\frac{f-f_0}{\tau}$. Here, the existence of a temperature gradient in the x-direction and of a magnetic field perpendicular to the heat flux is taken into account. ξ is the energy of the electron in the normal metal, Δ the gap in the energy

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Thermo-magnetic Effects in Superconductors

S/056/60/039/002/040/044
B006/B070

spectrum, $\varepsilon = \sqrt{\xi^2+\Delta^2}$, $\vec{v} = \partial\varepsilon/\partial\vec{p}$, and $\xi = (p^2-p_0^2)/2m$. The relaxation time $\tau = \tau_0 \varepsilon/|\xi|$, where τ_0 is the relaxation time for ordinary electrons. The equation of motion is solved by the method of successive approximation ($f = f_0 + f^{(1)} + f^{(2)}$) on the assumption that either the dimensions of the body be small compared to the depth of penetration, or that $\partial H/\partial z = 0$. The following relations are obtained for the correction terms to the distribution function (due to temperature gradient and magnetic field):

$$f^{(1)} = \frac{p_x}{m}\tau_0 \frac{\partial f_0}{\partial \varepsilon}\frac{\varepsilon}{T}\frac{\partial T}{\partial x}\frac{\xi}{|\xi|}, \quad f^{(2)} = \tau_0^2 \frac{1}{T}\frac{eH}{cm}\frac{\partial T}{\partial x}\frac{\varepsilon^2}{|\xi|}\frac{\partial f_0}{\partial \varepsilon} v_y ; \quad f_c = [\exp(\varepsilon/kT)+1]^{-1}$$

The coefficient of the Leduc-Righi effect (which consists in the appearance of a temperature gradient perpendicular to the direction of the resulting heat flux) is $L = \frac{\partial T}{\partial y'}\Big/\frac{\partial T}{\partial x'} H$ (x' coincides with the direction of the resulting heat flux). It is shown that $L = Q_y/Q_x H$ with $Q_y/Q_x = \tau_0 eH/mc$. L is, therefore, independent of Δ, and does not alter on transition from

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Thermo-magnetic Effects in Superconductors

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S/056/60/039/002/040/044
B006/B070

the normal to the superconducting state. The Nernst-Ettinghausen effect (appearance of an electric field perpendicular to the resulting heat flux) is, therefore, absent in superconductors. There are 2 Soviet references.

ASSOCIATION: Gosudarstvennyy pedagogicheskiy institut (State Pedagogical Institute)

SUBMITTED: March 31, 1960

Card 3/3

89221

9,9600 (2301, 2303)
10.8000

S/056/61/040/001/027/037
B102/B212

AUTHORS: Pitayevskiy, L. P., Kresin, V. Z.

TITLE: Disturbances which occur when bodies are moving in a plasma

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 1, 1961, 271-281

TEXT: A problem which lately has become topical is the scattering of electromagnetic waves by the track of a body moving in an isotropic electron-ion plasma. The present paper deals with the theoretical study of this problem. The plasma is assumed to be diluted to such an extent that the mean free path of ions is large compared to both the length of the scattered electromagnetic wave and the dimensions of the body ($l \gg \lambda, R_0$). The scattering problem in question can be divided into two parts: Scattering on the body itself (e.g., a metal sphere) and scattering on a track formed by the sphere in the plasma; i.e., in the region of disturbed electron concentration. The scattering by the body itself can be described by conventional formulas of the diffraction theory and is not investigated here any further; however, it is much larger than that on the part of a track of the

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Disturbances which occur ...

same length. Scattering on a track yields a noticeable contribution to the total scattering effect only if $\lambda \gg R_0$; studies conducted on the basis of the perturbation theory are restricted to such a case. It is assumed that the change of the dielectric constant of the plasma with a disturbed density δn is described by the relation

$\delta\varepsilon(\vec{r}) = -\frac{4\pi e^2}{m\omega^2}\delta n(\vec{r})$, and if $r \gg \lambda$ then $\vec{E}' = \frac{e^2}{mc^2}\frac{e^{ikR}}{R} n_q [\vec{k}', [\vec{k}', \vec{E}_0]]$, with $\vec{E}_0$ denoting the amplitude of the incident wave, $\vec{k}'$ the wave vector of the scattered wave ($|\vec{k}'| = k = \sqrt{\varepsilon}\omega/c$), the Fourier component of the disturbance of the electron density being given by $n_q = \int \delta n(\vec{r}) e^{-i\vec{q}\vec{r}} d^3r$. $\vec{q} = \vec{k}' - \vec{k}$, $|\vec{q}| = 2k \sin \Psi/2$, where $\vec{k}$ is the wave vector of the incident wave, Ψ the scattering angle (between $\vec{k}$ and $\vec{k}'$). The cross section in a solid angle do is given by $d\sigma = \frac{1}{16\pi^2\varepsilon}\left(\frac{\omega}{\omega_0}\right)^4 \frac{|n_q|^2}{n_0^2} k^4 \sin^2\Psi_1 do$. In order to determine $d\sigma$ it is necessary

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Disturbances which occur ...

to know $n_{\vec{q}}$. $n_{\vec{q}}$ may be determined by formulas of A. V. Gurevich, but here it is shown that it is easier to determine it directly from the equation of motion. The method brought here to determine $n_{\vec{q}}$ is also more exact, and it is possible to take into account effects occurring at small $\vec{q}$, which is not possible with the Gurevich method. General formulas are first derived for the case where the body is moving much slower than the thermal electrons ($V_o \ll \sqrt{kT/m}$). In this case the electron density is a function of the potential according to Boltzmann: $n = n_o \exp(e\varphi/kT)$. After extensive calculations the following expressions are obtained:

$$n_{\vec{q}} = \frac{1}{iq}\int \frac{I(\vec{u})}{n(\vec{u}-\vec{V}_o)-i\delta}\, d^3u \Big/ \left[2 - 2a\left(\int_0^a e^{x^2}dx - i\sqrt{\pi}/2\right)e^{-a^2}\right]; \quad a = n\vec{V}_o\sqrt{M/2kT};$$

$\vec{u} = \vec{v} + \vec{V}_o$, $\vec{v}$ is the ion velocity in a coordinate system moving with the body, M is the ion mass. The electron density decreases in proportion to $1/r^2$; this agrees with Gurevich. Furthermore, a formula is derived for $I(\vec{u})$; its calculation requires the knowledge of the law of ion scattering on a body with the electric field being taken into account. Though this

formula does not permit the computation of $I(\vec{u})$ in the general case, it is possible to determine $I(\vec{u})$ for some special cases, as shown next. The calculation of the "collision integral" $I(\vec{u})$ is done for a) a slowly moving body ($V_0 \ll \sqrt{kT/M}$); b) a fast moving body ($V_0 \gg \sqrt{kT/M}$) with dimensions that are not small compared to the Debye radius; c) a small charged body ($eQ \ll R_D M v_1^2$). After this, $d\sigma$ and $n_{\vec{q}}$, respectively, is calculated for a slowly moving body, a fast moving large body

$$n_q = \frac{n_0 \sigma_0}{q}\left\{\left[\frac{\pi}{2} - \sqrt{\pi}\left(\frac{MV_0^2}{2kT}\right)^{1/2} e^{-a^2}\right] + i2\left(\frac{MV_0^2}{2kT}\right)^{1/2} e^{-a^2}\int_0^a e^{x^2}dx\right\} \times$$
$$\times \left[2\left(1 - ae^{-a^2}\int_0^a e^{x^2}dx\right) - ia\sqrt{\pi}e^{-a^2}\right]^{-1} \qquad (41)$$

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$$d\sigma = \frac{\sin^2\psi_1}{16\pi^2}\left(\frac{\omega_0}{c}\right)^4 \frac{\sigma_0^2}{q^2}\left\{\left[\frac{\pi}{2} - \sqrt{\pi}\left(\frac{MV_0^2}{2kT}\right)^{1/2} e^{-a^2}\right]^2 + 4\left(\frac{MV_0^2}{2kT}\right)\left(e^{-a^2}\int_0^a e^{x^2}dx\right)^2\right\} \times$$
$$\times \left[4\left(1 - ae^{-a^2}\int_0^a e^{x^2}dx\right)^2 + a^2\pi e^{-2a^2}\right]^{-1} \qquad (42)$$

Disturbances which occur ...

and a fast moving small body

$$n_q = \frac{2\pi Q^2 e^4 n_0}{q\,(2k^3T^3MV_0^2)^{1/2}} \ln\frac{R_D}{r_0}\left[V_0^2 - (V_0 n)^2\right]\left[(1-2a^2)\left(\sqrt{\pi} + 2i\int_0^a e^{x^2}dx\right)e^{-a^2} + 2ia\right]\times$$

$$\times\left[2 - 2a\left(\int_0^a e^{x^2}dx - i\frac{\sqrt{\pi}}{2}\right)e^{-a^2}\right]^{-1}. \qquad (45)$$

The authors thank Ya. L. Al'pert and A. V. Gurevich for discussions. A. G. Sitenko and S. N. Stepanov are mentioned. There are 8 references: 6 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATON: Institut zemnogo magnetizma, ionosfery i rasprostraneniya radiovoln Akademii nauk SSSR (Institute of Terrestrial Magnetism, Ionosphere, and Propagation of Radiowaves, Academy of Sciences USSR)

SUBMITTED: July 27, 1960

S/056/61/040/003/028/031
B112/B214

24.7700

AUTHORS: Geylikman, B. T., Kresin, V. Z.

TITLE: The effect of anisotropy on the properties of supraconductors

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40, no. 3, 1961, 970-972

TEXT: The present paper deals with the properties of anisotropic supraconductors. The anisotropy of the conductor enters the Hamiltonian operator of the interaction characteristic of conductivity. This Hamiltonian operator is subjected to a canonical transformation according to N. N. Bogolyubov (Ref. 2: ZhETF, 34, 58, 1958). In this way, an integral equation for the band $\Delta(\vec{k})$ of the energy spectrum of the supraconductor is obtained. This equation is solved for an ellipsoidal and a cylindrical supraconductor. In the case of an ellipsoidal conductor the result is: $\Delta(\vec{k},T) = \Delta_1(T)\left[1+(\frac{\Delta m}{m_1})^2 \frac{b+c}{a}(\frac{11}{6}\cos^4\vartheta-\cos^2\vartheta+\frac{1}{2})\right]$, $\frac{\Delta_1(T)}{T} = 3.06\left[(1-\frac{T}{T_k})(1+\frac{\Delta m}{m_1})^2 \frac{b+c}{2a}\right]^{1/2}$, where T is the temperature, T_k the

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The effect of anisotropy...

critical temperature, m_1, m_2 ($\Delta m = m_1 - m_2$) the Fermi surface parameter, a,b,c constants and ϑ the angle between the z-axis of the coordinate system and the vector $\vec{k}$. In connection with this, the specific heat C of the supraconductor is investigated and it is found that $C_s(T_k)/C_n(T_k) = 2.4 + 1.4\,\frac{b+c}{a}\left(\frac{\Delta m}{m_1}\right)^2$ and $C_s(T)/C_n(T_k)$ $= \frac{1}{\pi T_k}\left(\frac{\pi}{2}\right)^{1/2} T^{-3/2}\Delta^{5/2}(0)\exp\left(\frac{-\Delta(0)+\beta}{T}\right)\sqrt{\frac{\pi T}{2\beta}}$; $\Delta(0) = \overline{\Delta(\vartheta)}$, $\beta = \frac{b+c}{a}\left(\frac{\Delta m}{m_1}\right)^2\Delta(0)$ for low temperatures. In the neighborhood of the critical temperature T_k $\Delta(0)$ is the decisive quantity for the specific heat C_s, for $T \to 0$ this quantity is Δ_{min}. The consequence of this is that in the anisotropic model C_s decreases with decreasing temperature more slowly than in the isotropic model, which agrees with the experimental results. Since the Fermi surface parameters appear in the expression of C_s the latter is not a universal function of the temperature as in the isotropic model. This

The effect of anisotropy... S/056/61/040/003/028/031
B112/B214

is the explanation of the difference in the experimental curves for C_s for different supraconductors. There are 5 references: 3 Soviet-bloc and 2 non-Soviet-bloc.

ASSOCIATION: Moskovskiy zaochnyy pedagogicheskiy institut (Moscow Correspondence Pedagogical Institute)

SUBMITTED: December 7, 1960

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24.2140 (1033, 1072, 1482)

28929
S/056/61/041/004/013/019
B113/B112

AUTHORS: Geylikman, B. T., Kresin, V. Z.

TITLE: Thermal conductivity of pure superconductors and absorption of sound in superconductors

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 4(10), 1961, 1142 - 1150

TEXT: The authors study the electron thermal conductivity of superconductors in connection with scattering of electrons on phonons, as well as the absorption of ultra-sound and sound in superconductors. If one integrates the kinetic equation (written in Fermi amplitudes), into which the required electron distribution function enters, over the angles ϑ between the wave vector $\vec{q}$ of a phonon and the momentum $\vec{p}$ of the electron, and then over the energy ε of the electron excitation, and if one puts $\varepsilon/T = z$, $\hbar\omega/T = x$; $\Delta/T = b$; $|V'|^2 - |V^2|/q$, then one obtains

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Thermal conductivity of pure ....

$$\varphi = \frac{a(\Omega)}{T^4\Phi(T)} \int_b^\infty f_0 e^z z \sqrt{z^2 - b^2}\, dz \frac{\partial T}{\partial x};$$

$$\Phi(T) = \int_0^\infty \frac{4x^4}{e^x - 1} \int_b^\infty \frac{dz}{(e^z + 1)(e^{-z-x} + 1)} + \int_{2b}^\infty \frac{x^4\, dx}{e^x - 1} \int_b^{x-b} \frac{dz}{(e^z + 1)(e^{-z} + e^{-x})} \qquad (1.3).$$

Here, $a(\Omega)$ is the function which depends on the angles determining the direction of motion of the electron. If one calculates the heat flow $Q = \int \varepsilon v_x f dp$, where f is the electron distribution function, then one obtains

$$Q = \frac{\text{const}}{\Phi(T)\, T^3} \overline{a(\Omega)} \left[\int_b^\infty f_0 e^z z \sqrt{z^2 - b^2}\, dz \right]^2 \frac{\partial T}{\partial x}. \qquad (1.4)$$

taking account of (1.3). After calculating the integral entering (1.4), one obtains

$$\varkappa = -Q \Big/ \frac{\partial T}{\partial x} = \frac{\text{const}}{\Phi(T)\, T^3} \left[b^2 \sum_{s=1}^\infty K_2(bs) \right]^2, \qquad (1.5),$$

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where $K_2(bs)$ is the Bessel function of an imaginary argument, and $\phi(T)$ is expressed by

$$\Phi(T) = 96\zeta(4)\ln(1+e^{-b}) + \sum_{s=1}^{\infty} s^{-5}e^{-2bs}(80b^4s^4 + 160b^3s^3 + 240b^2s^2 + \quad (1.6).$$

$$+ 240bs + 120) - \ln(e^b + 1)\sum_{s=1}^{\infty} s^{-4}e^{-2bs}(64b^3s^3 + 96b^2s^2 + 96bs + 48). \quad (1.6)$$

When studying the absorption of ultra-sound in superconductors, the case is considered in which $\omega \gg \frac{1}{\tau}$, where ω is the audio-frequency, and τ is the relaxation time of electron excitations. Then, the number of phonons of the frequency ω is $N \gg 1$. The absorption coefficient γ is proportional to the difference between the absorption probability of a phonon and the probability of the reverse process, and results from

$$\gamma = \text{const}\cdot T\left[\int_b^{\infty}(f - f')\,dz + D(x)\int_b^{x-b}(1 - f - f')\,dz\right]; \quad (A),$$

$$f = (e^z + 1)^{-1}, \quad b = \Delta/T, \quad z = \varepsilon/T, \quad x = \hbar\omega/T.$$

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where f is the number of electron excitations with the energy ε. The problem of absorption of a longwave sound, where $\omega \ll \frac{1}{\tau}$, is handled by solving the corresponding kinetic equation and calculating the dissipation function. If one integrates the kinetic equation over the angle ϑ between $\vec{p}$ and $\vec{q}$, over $z = \varepsilon/T$, and over the angles in the momentum space of the electrons, one obtains a function $\varphi(\varepsilon)$ in the form $\varphi = \frac{\text{const}}{T^5} \frac{1}{(e^b+1)\,\Phi(T)}$, where $\Phi(T)$ is expressed by (1.6). The dissipation function to be calculated is equal to: $W = T\dot{S}$, where S is the entropy of the gas of electron excitations. If one integrates over ε and over the angles in the momentum space of the phonons, one obtains: $W = \frac{\text{const}}{T^5} \frac{1}{(e^b+1)^2\,\Phi(T)}$. The absorption coefficient of longwave sound is proportional to W, and has the form $\gamma_{se} = \gamma_{ne} \frac{4\,\Phi(T_k)}{(e^b+1)^2\,\Phi(T)}$, where $\gamma_{ne} = \text{const}/T^5$ is the absorption coefficient of sound in normal

Card 4/5

Thermal conductivity of pure ...

metal, and $\phi(T)$ is expressed by (1.6). The problem of absorption of sound energy by phonons is solved in a similar manner. L. D. Landau, P. A. Pomeranchuk (ZhETF, 7, 180, 1937), and N. N. Bogolyubov (ZhETF, 34, 58, 1958) are mentioned. There are 3 figures and 13 references: 8 Soviet and 5 non-Soviet. The three most recent references to English-language publications read as follows: A. M. Guenelt. Intern. Conf. on Superconductivity, Cambridge, 1959; E. E. Jones, A. M. Toxen, Phys. Rev., 120, 1167, 1960; J. Bardeen, G. Rickayzen, L. Tewordt. Phys. Rev., 113, 982, 1959.

ASSOCIATION: Moskovskiy gosudarstvennyy pedagogicheskiy institut (Moscow State Pedagogical Institute)

SUBMITTED: March 30, 1961

Card 5/5

KRESIN, V.Z.

Absorption of sound in superconductors. Uch. zap. MGZPI no.9:34-45 '62. (MIRA 16:6)

(Absorption of sound)
(Superconductivity)

44142

S/181/62/004/010/029/063
B108/B104

24.7140

AUTHOR: Kresin, V. Z.

TITLE: The problem of the electrodynamics of superconductors

PERIODICAL: Fizika tverdogo tela, v. 4, no. 10, 1962, 2832-2834

TEXT: On the basis of a method proposed by L. P. Gor'kov (ZhETF, 34, 735, 1958) a gauge invariant calculation of the current density in a superconductor is made. The addition to the Green function caused by the external field is expanded into Fourier series resulting in the expression

$$j_k = \frac{e^2}{m^2 c} \sum_p p(pA_k) \frac{\varepsilon_1\varepsilon_2 - \xi_1\xi_2 - \Delta^2}{\varepsilon_1\varepsilon_2(\varepsilon_1+\varepsilon_2)} + \frac{e}{m} \sum_p p \frac{\Delta'_k\xi_1 + \Delta''_k\xi_2}{\varepsilon_1\varepsilon_2(\varepsilon_1+\varepsilon_2)} - \frac{Ne^2}{mc} A_k \quad (7)$$

for the Fourier components of the current density. ξ is the energy of the electron with reference to the Fermi surface $\varepsilon = \sqrt{\xi^2 + \Delta^2}$, Δ is the gap in the energy spectrum, Δ' is an addition to the gap caused by the external field. $\Delta_{\vec{p}+\vec{k}/2}$, $\vec{p}-\vec{k}/2 = \Delta_{\vec{k}}$; the subscripts 1 and 2 correspond to

Card 1/2

The problem of the...

$\vec{p}+\vec{k}/2$ and $\vec{p}-\vec{k}/2$, respectively. For an isotropic superconductor, the second term on the right-hand side of Eq. (7) is a vector directed along $\vec{k}$ (chosen here as the z-direction). The vector $\vec{A}_{\vec{k}}$ is assumed to lie in the zOy-plane. With the equation of continuity $\vec{k}\vec{j}_{\vec{k}} = 0$, the final expression for the current density is

$$\mathbf{j}_k = \left[\frac{e^2}{m^2c}\sum_p p_y^2 F - \frac{Ne^2}{mc}\right]\left(\mathbf{A}_k - \frac{\mathbf{k}\mathbf{A}_k}{k^2}\mathbf{k}\right) \qquad (11)$$

or $\vec{j}_{\vec{k}} = K(\vec{k})\vec{A}_{\perp\vec{k}}$, where $\vec{A}_{\perp\vec{k}}$ is the part of the vector potential perpendicular to $\vec{k}$. $K(\vec{k})$ is the Pippard kernel, $F = \frac{\varepsilon_1\varepsilon_2 - \xi_1\xi_2 - \Delta^2}{\varepsilon_1\varepsilon_2(\varepsilon_1+\varepsilon_2)}$.

A relationship between the current density and the vector potential for the anisotropic case can be established in a similar manner.

ASSOCIATION: Moskovskiy gosudarstvennyy zaochnyy pedagogicheskiy institut (Moscow State Correspondence Pedagogical Institute)

SUBMITTED: May 28, 1962

Card 2/2

BLUDOV, M.I. (st. Pravda Moskovskoy oblasti); KRESIN, V.Z., kand.fiziko-matematicheskikh nauk (Moskva)

Editor's mail. Fiz.v shkole 22 no.6:85-87 N-D '62. (MIRA 16:2)

(Magnetic fields) (Paint, Luminous) (Ionization)

S/058/63/000/003/081/104
A059/A101

AUTHOR: Kresin, V. Z.

TITLE: On the absorption of sound in superconductors

PERIODICAL: Referativnyy zhurnal, Fizika, no. 3, 1963, 101, abstract 3E710 ("Uch. zap. Mosk. gos. zaochn. ped. in-t", 1962, no. 9, 34 - 45)

TEXT: The problem of the absorption of ultrasonics (US) in a superconductor is solved when the period of US is greater than the characteristic relaxation time. The sonic field is considered as a factor leading to a lattice distortion resulting, in turn, in the change of the energy gap. Attenuation of US due to thermal conductivity is not taken into account. The calculated results are shown to be correct also for the case of a doped superconductor. It is shown that US absorption is considerably decreased on transition to the superconducting state.

R. Suris

[Abstracter's note: Complete translation]

Card 1/1

KRESIN, V.Z., kand.fiziko-matematicheskikh nauk,(Moskva); TAVGER, B.A., kand.fiziko-matematicheskikh nauk (Gor'kiy)

Studying the quantum nature of light. Fiz.v shkole 22 no.5:105-107 S-O '62. (MIRA 15:12)
(Quantum theory--Study and teaching)
(Light--Study and teaching)

GEYLIKMAN, B.T.; KRESIN, V.Z.

Anisotropy effect on superconductivity. Fiz. tver. tela 5 no.12:3549-3559 D '63. (MIRA 17:2)

1. Moskovskiy gosudarstvennyy zaochnyy pedagogicheskiy institut.

L 6476-66 EWT(l)/EWT(m)/EWP(i)/EWP(t)/EWP(b) IJP(c) JD/GG

ACC NR: AP5025252 SOURCE CODE: UR/0386/65/002/004/0160/0164

AUTHOR: Kresin, V. Z.; Tavger, B. A.

ORG: Moscow State Extension Pedagogical Institute (Moskovskiy gosudarstvennyy zaochnyy pedagogicheskiy institut)

TITLE: Possible superconductivity mechanism in crystalline films

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu (Prilozheniye), v. 2, no. 4, 1965, 160-164

TOPIC TAGS: superconductivity, electron state, band spectrum, semiconducting film

ABSTRACT: The authors consider one possibility of establishment of a superconducting state, due to the presence of different groups of electrons in a crystalline film. The interaction between the electrons of these groups leads, if certain conditions are satisfied, to Cooper pairing. Different groups of electronic states (subbands) arise in the film because of the finite character of the transverse motion of the electrons (holes), and in each n-th group the state is given by the longitudinal projection of the quasimomentum. In addition, in semiconducting films the degeneracy of the edge of the band, frequently encountered in bulky samples, is lifted because of the decrease in symmetry, leading to the formation of two or more two-dimensional bands, with the edges of the bands shifting relative to one another, and with the electrons differing in their effective masses and wave functions. A quantitative calculation of the effect is made for a model corresponding to the possible band struc-

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6476-66

ACC NR: AP5025252

ture of a semiconducting film. There are two groups of electronic states. The Coulomb interaction of the electrons of the first and second groups leads to an effective interaction between the electrons of the first group. Conditions under which attraction occurs are determined. An equation is derived for the transition temperature and solved graphically. Possible application of the results to superconducting semiconductors is discussed. Authors thank B. T. Geylikman for continuous interest in the work and useful discussions, and L. P. Pitayevskiy and R. A. Suris for interesting discussions. Orig. art. has: 1 figure and 5 formulas.

SUB CODE: GP,SS SUBM DATE: 09Jun65/ ORIG REF: 006/ OTH REF: 002

nw

Card 2/2

L 6418-66 EWT(d)/EWT(l)/EPF(c)/EEC(k)-2/EPF(n)-2/T/ETC(m) IJP(c) WW/GG

ACC NR: AP5027407 SOURCE CODE: UR/0181/65/007/011/3294/3301

AUTHOR: Geylikman, B. T.; Kresin, V. Z.

ORG: Moscow State Teachers' Correspondence Institute (Moskovskiy gosudarstvennyy zaochnyy pedagogicheskiy institut)

TITLE: Critical temperature for ordinary and anomalous superconductors

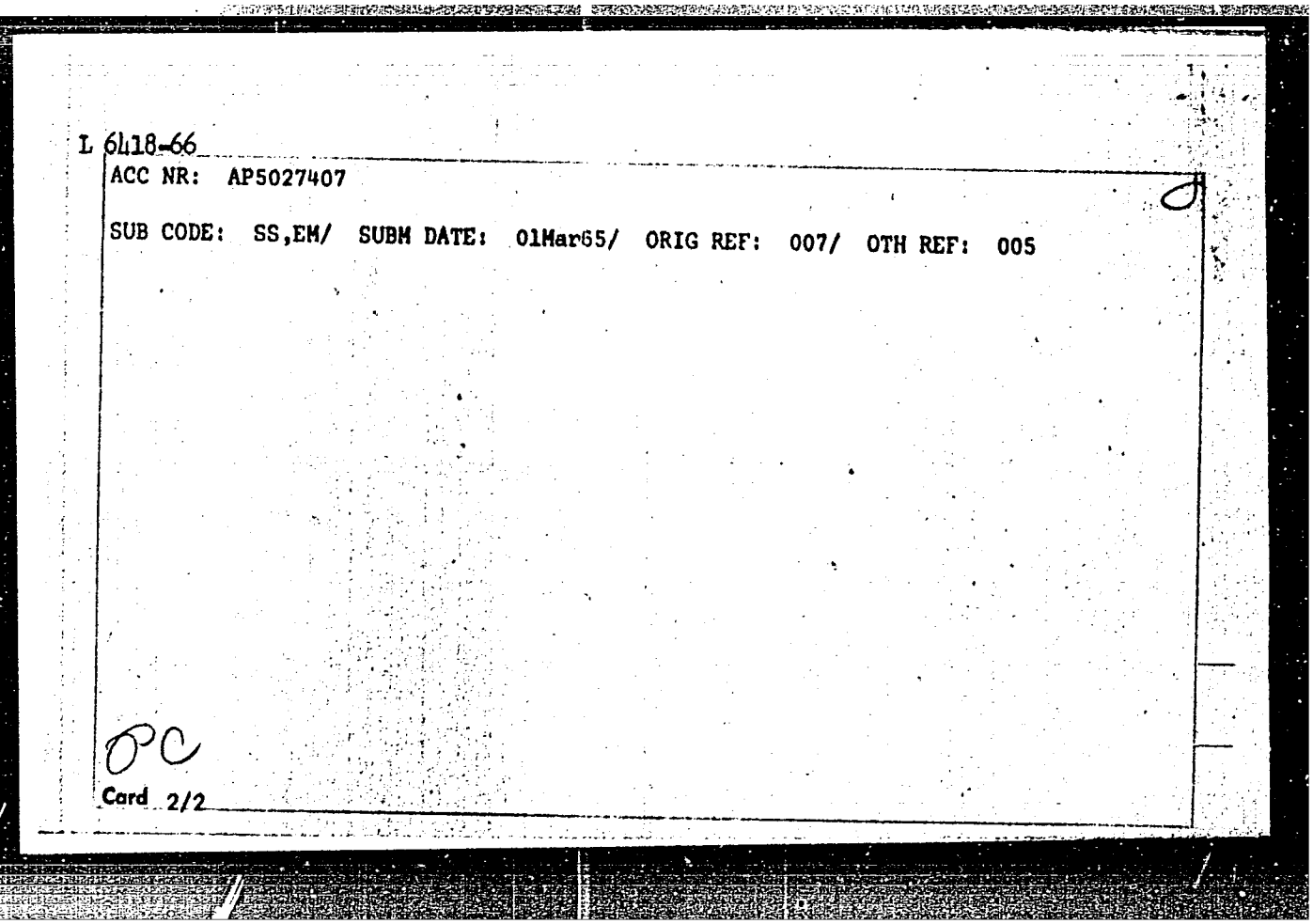
SOURCE: Fizika tverdogo tela, v. 7, no. 11, 1965, 3294-3301

TOPIC TAGS: superconductivity, phonon interaction, electron interaction, low temperature effect

ABSTRACT: A formula is derived for the relationship between the constant of electron-phonon interaction and the critical temperature T_k in the Fröhlich model for ordinary superconductors. An expression is found relating T_k to $\Delta(0)$, the gap in the energy spectrum at the absolute zero of temperature, for anomalous superconductors (Pb, Hg). A model is proposed for the phonon energy which gives a better approximation than the Debye theory. It is suggested that the anomalous properties of Hg are due to the strong relationship between Θ and T. Orig. art. has: 2 figures, 9 formulas.

Card 1/2

0901 2032



L 6418-66
ACC NR: AP5027407

SUB CODE: SS,EM/ SUBM DATE: 01Mar65/ ORIG REF: 007/ OTH REF: 005

OC

Card 2/2

L 15172-66 EWT(1) IJP(c) GG
ACC NR: AP6002424 SOURCE CODE: UR/0020/65/165/005/1059/1061

AUTHOR: Kresin, V. Z.

ORG: Moscow State Pedagogical Correspondence Institute (Moskovskiy gosudarstvennyy zaochnyy pedagogicheskiy institut)

TITLE: Mechanisms responsible for superconductivity 21

SOURCE: AN SSSR. Doklady, v. 165, no. 5, 1965, 1059-1061

TOPIC TAGS: superconductivity, molecular physics , molecule, crystal lattice, electron interaction

ABSTRACT: The author considers a possible mechanism for the superconductive state which is similar in many respects to the ordinary Frölich mechanism, but permits interaction between electrons in a wider energy region close to the Fermi surface. Interelectron attraction in this model may be due to molecules in the crystal lattice. The molecule is polarized by the field of an electron with a transition to the excited oscillatory level. The molecular polarization causes a change in its electric field which affects the state of another electron. The energy of this electron is changed by a return of the molecule to the ground state. The interaction between electrons may be imagined as an exchange of "virtual" quanta which

Card 1/2 UDC: 537.312.62

L 15172-66
ACC NR: AP6002424

describe the excitation of oscillatory molecular levels. This mechanism is completely analogous to the ordinary mechanism with the difference that in this case the part of oscillatory lattice energy levels is played by oscillatory molecular levels. The distinguishing features of the proposed model are discussed. An experiment is proposed for verification of this model which requires a heavily doped metal or semiconductor. It is possible that the proposed conditions for the experiment could be met by joint condensation of vapors which contain molecules of the base material and the dopant. In this way a crystal could be produced with ordered distribution of the dopant molecules. Superconductivity is possible in presently known molecular crystals with high electrical conductivity due to the overlapping of the orbits of π-electrons. In this case the superconductivity would be the result of the interaction between conduction electrons and the oscillatory levels of the molecules which make up the crystal. In conclusion, the author is sincerely grateful to B. T. Geylikman for interest and useful consultation. Orig. art. has: 4 figures.

SUB CODE: 20/ SUBM DATE: 09Apr65/ ORIG REF: 006/ OTH REF: 004

Card 2/2

L 03701-66 EWT(1)/EPF(n)-2/ETC(m)-6 IJP(c) GG

ACC NR: AP6006802 SOURCE CODE: UR/0386/66/003/001/0048/0051

AUTHORS: Geylikman, B. T.; Kresin, V. Z.

ORG: Moscow State Extension Pedagogical Institute (Moskovskiy gosudarstvennyy zaochnyy pedagogicheskiy institut)

TITLE: Jump in specific heat on going from the superconducting to the normal state

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 3, no. 1, 1966, 48-51

TOPIC TAGS: specific heat, superconductivity, phase transition, energy band structure, critical point

ABSTRACT: The authors investigate the ratio of the electronic specific heats in the superconducting and normal states from the point of view of the two-band model. The need for such an investigation is dictated by the fact that superconductors for which the theoretical requirement that this ratio (α) be smaller than 2.4 is not satisfied are characterized by the presence of overlapping bands. The calcula-

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L 23764-66
ACC NR: AP6006802

tion involves determination of the two self-energy parts of the individual bands and the values of the corresponding energies. The results show that generally speaking the relation $\alpha = 2.4$ is not satisifed in the two-band model, and that values > 2.4 are perfectly admissible. This shows that the band overlap for superconducting elements is not an exception but the rule. In particular, all elements for which experiment yields $\alpha > 2.4$ have a non-single-band structure (Nb, Ta, and V have $\alpha = 3.07$, 2.58, and 2.57, respectively). The overlap effect is small for elements for which $\alpha \leq 2.4$. In the presence of two gaps, a deviation is observed of the specific heat from the ordinary exponential dependence in the low temperature region. It is concluded from the analysis that the temperature variation of the specific heat changes appreciably in the presence of an overlapping energy band. The magnitude of the jump in specific heat on going from the superconducting state to the normal phase is thus likewise essentially different. At the critical point, the non-single-band model yields larger values for α than the isotropic single-band model. Orig. art. has: 4 formulas.

SUB CODE: 20/ SUBM DATE: 22Nov65/ ORIG REF: 008/ OTH REF: 005

Card 2/2 UVP

L 43703-66 EWT(l)/EWT(m)/T/EWP(t)/ETI IJP(c)

ACC NR: AP6020228 SOURCE CODE: UR/0056/66/050/006/1689/1698

AUTHOR: Kresin, V. Z.; Tavger, B. A.

ORG: Moscow State Correspondence Pedagogical Institute (Moskovskiy gosudarstvennyy zaochnyy pedagogicheskiy institut)

TITLE: Superconducting transition temperature of a thin film

SOURCE: Zh eksper i teor fiz, v. 50, no. 6, 1966, 1689-1698

TOPIC TAGS: magnetic thin film, electron interaction, phonon interaction, temperature measurement, superconductivity

ABSTRACT: It has been shown that the normal electron-phonon interaction leads to an increase in the critical temperature T_k with a decrease in film thickness L because of the special nature of the electron pairing. The increase in T_K is particularly large for $L \sim 10^{-6}$ cm. With a further decrease in L ($L \leq 10^{-7}$ cm) the dependence becomes exponential. The results include the experimental data.

Card 1/2

ACC NR: AP6020228

The accuracy of this interpretation can be confirmed by measurments of the isotopic effect. The possibility of an electron mechanism, determined by the presence of different electron groups in the film, has been investigated. The authors thank B. T. Geylikman for his constant interest in this work and valuable criticism, and D. A. Kirzhnits, A. I. Larkin, and L. P. Pitayevskiy for their interesting discussions. Orig. art. has: 1 figure and 21 formulas. [Based on authors' abstract] [NT]

SUB CODE: 20/ SUBM DATE: 31Jan66/ ORIG REF: 012/ OTH REF: 012/

Card 2/2

1. KRESINA, E. V.; SHESTERYKOVA, T. P.

2. USSR (600)

4. Eye

7. Effect of light and of shutting it off on the biochemical processes in the eye tissues. Part 2. Effect of light and of shutting it off on the content of ascorbic acid in the eye tissues. Ukr. biokhim. zhur. 24, No. 1, 1952.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

KRESINA, I. Ya.

LAVROV, Nikolay Petrovich, prof., doktor biol.nauk; FORMOZOV, A.N., prof., doktor biol.nauk, otvetstvennyy red.; KRESINA, I.Ya., red.; TROFIMOV, A.V., tekhn.red.

[Acclimatization of the muskrat in the U.S.S.R.] Akklimatizatsiia ondatry v SSSR. Moskva, Izd-vo TSentrosoiuza, 1957. 529 p. (Muskrats) (MIRA 11:5)

KRSINA, L.

Rates of outp t in the clothing industry. p. 13.
Adaptation of sizing machines. p. 14. (Textil, Praha, Vol. 9, no.1, Jan. 1954)

SO: Monthly list of East European Accessions (EEAL), LC Vol 4, No. 6, June 1955, Uncl

[illegible], I.

Technology of production in the clothing industry. p. 239. TEXTIL. (Ministerstvo lehkeho prumyslu) Praha. Vol. 9, no. 8, Aug. 1954.

SOURCE: East European Accessions List, Vol. 5, no. 9, September 1956

KRUSINA, L.M.

History of the labor movement in the Vladimir Government on the eve of the First Russian Revolution, 1901-1904. Uch. zap. MOPI 110:103-137 '57. (MIRA 11:4)
(Vladimir Government--Labor and laboring classes)
(Vladimir Government--Russian Social Democratic Party)

Country : USSR E
Category: Virology. Bacterial Viruses (Phages)

Abs Jour: Ref Zhur-Biol., No 23, 1958, No 103510

Author : Kresitadze, I. F.
Inst : -
Title : Use of Bacteriophage in Veterinary Practice

Orig Pub: Sb. Bakteriofagiya. Tbilisi, Gruzmedgiz, 1957, 337-344.

Abstract: The great therapeutic and prophylactic effectiveness of specific phages in the fight against paratyphoid and colibacillosis of calves was shown on a large collection of experimental material. -- Ya. I. Rautenshteyn.

Card : 1/1

JAROSZYNSKA-WEINBERGER, Barbara; SPORZYNSKI, Tadeusz; MESZAROS, Jadwiga; KRESKA, Barbara, asystent techniczny.

Angina after smallpox vaccination and an attempt to establish its etiology. Przegl. epidem. 19 no.3:331-334 '65.

1. Z Kliniki Chorob Zakaznych Wieku Dziecinego AM w Warszawie (Kierownik: prof. dr. J. Bogdanowicz) i z Zakladu Epidemiologii Panstwowego Zakladu Higieny w Warszawie (Kierownik: prof. dr. J. Kostrzewski).

MESZAROS, Jadwiga; FIDZIANSKA, Elzbieta; KRESKA, Barbara

Laboratory diagnosis of smallpox during the 1963 epidemic in Poland. Przegl. epidem. 19 no.3:335-346 '65.

1. Z Zakladu Epidemiologii Panstwowego Zakladu Higieny w Warszawie (Kierownik: prof. dr. med. J. Kostrzewski) i z Zakladu Wirusologii Pan'stwowego Zakladu Higieny w Warszawie (Kierownik: dr. med. Z. Wroblewska).

POLAND

MESZAROS, Jadwiga; JAROSZYNSKA-WEINBERGER, Barbara; and KRESKA, Barbara; Department of Epidemiology, National Institute of Hygiene (Zaklad Epidemiologiczny Panstwowego Zakladu Higieny) Head (Kierownik) Prof Dr J. KOSTRZEWSKI, and Clinic for Children with Infectious Diseases (Klinika Chorob Zakaznych Wieku Dziecicego), Head Prof Dr J. BOGDANOWICZ, [Warsaw.]

"Serologic Data on Children Following Smallpox Vaccination Protected by either Gamma Globulin or Methisazone."

Warsaw, Przeglad Epidemiologiczny, Vol 19, No 4, 1965, pp 417-420

Abstract [English summary modified]: There was essentially no difference in the hemagglutinating antibody increase between that noted in 19 children vaccinated against smallpox while orally treated with methisazone, and 22 who received gamma globulin instead: in both groups, the increase was fourfold or higher. Two tables, 1 Polish unpublished, 1 Soviet and 5 Western references.

1/1

MAJSKY, A.; RERABKOVA, E.; PESKOVA, D.; Technical collaboration: KRESKEVOA, M.; KRECEK, M.

The demonstration in some permanent strains of malignant cells of group-specific ABO (ABH) agglutinogens and D(Rh_o) receptors. Neoplasma 9 no.2:141-149 '62.

1. Institute of Haematology and Blood Transfusion, Prague, CSSR.

(NEOPLASMS immunol)

KRESKHOV, A. P., Prof. Dr.,

Moscow Institute of Chemical Technology imeni D. I. Mendeleyev
"Titration in waterfree media" Lecture Session A

Report to be sumbitted for the General Meeting on Modern Methods of Analytical Chemistry. Merseburg, East Germany, 24-25 Oct '63

KRESKOV, A.P. [Kreshkov, A.P.]; BIKOVA, L.N. [Bykova, L.N.]; KAZARIAN, N.A. [Kazaryan, N.A.]; ALDAROVA, N.S. [Aldarova, N.Sh.]

Advances in the field of the analysis of inorganic and organic compounds in nonaqueous solutions. Analele chimie 17 no.4:43-88 O-D '62.

KRESHKOV, Anatoliy Pavlovich; YAROSLAVTSEV, Anatoliy Anatol'yevich; ODERBERG, L.N., red.

[Course in analytical chemistry] Kurs analiticheskoi khimii. Izd.2., perer. Moskva, Khimiia. Book 2. 1964. 324 p. (MIRA 17:11)

KRESHKOV, A.P.; BYKOVA, L.N.; SMOLOVA, N.T.

Analysis of polycomponent mixtures of dicarboxylic acids by titration in nonaqueous solutions. Zhur. anal. khim. 19 no.2:156-162 '64. (MIRA 17:9)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni Mendeleyeva.

L 31842-66 T JK

ACC NR: AP6021325 (A) SOURCE CODE: PO/0081/65/019/003/0331/0334

AUTHOR: Jaroszynska-Weinberger, Barbara--Yaroshin'ska-Veynberger, V.; Sporzynski, Tadeusz--Spozhin'ski, T.; Meszaros, Jadwiga--Mesharos, Ya.; Kreska, Barbara--Kreska, B. (technical assistant) 32 B

ORG: Clinic of Infectious Diseases of Children/director: Professor Doctor J. Bogdanowicz/, AM, Warsaw (Klinka Chorob Zakaznych Wieku Dziecicego; Institute of Epidemiology/director: Professor Doctor J. Kostrzewski/, PZH, Warsaw (Zaklad Epidemiologii)

TITLE: Attempt at the determination of the etiology of angina after smallpox vaccination 60

SOURCE: Przeglad epidemiologiczny, v. 19, no. 3, 1965, 331-334

TOPIC TAGS: disease incidence, virus disease, bacteriology, immunization

ABSTRACT: Virological and bacteriologic tests of one hundred children vaccinated against smallpox for the first time revealed that throat inflammation (swelling of mucuous membrane, transparence of vesicles) occurs in 70 percent of the cases, usually 5-7 days after vaccination. In some cases the pattern of the disease is more serious (pseudodiphtherial angina) and appears 10-13 days after vaccination. Since no trace of vaccinia virus was found in inoculated chick embryos, it is assumed that the presence of the virus in blood at the time of vaccination may have a delayed allergizing effect. The authors thank Dr. M. Stopnicka, Dr. Z. Bilinska, Dr. W. Pstragowska, and Dr. H. Karwowska for making possible the research on the grounds of the Children and Infant's home. [JPRS]

SUB CODE: 06/ SUBM DATE: none/ ORIG REF: 001/ OTH REF: 010

Card 1/1 mc

L 31841-66 T JK

ACC NR: AP6021326 (A) SOURCE CODE: PO/0081/65/019/003/0335/0346

AUTHOR: Meszaros, Jadwiga--Mesharos, Ya.; Fidzianska, Elzbieta--Fidzyan'ska, O.; Kreska, Barbara--Kronska, V. 27 B

ORG: Institute of Epidemiology/director: Professor, Doctor of medicine J. Kostrzewski/, PZH, Warsaw (Zaklad Epidemiologii); State Virologic Institute (Zaklad Wirusologii Pantstwowego ; Institute of Hygiene, Warsaw (Zaklad Higieny)

TITLE: Laboratory diagnosis of smallpox during the epidemic in Poland in 1963

SOURCE: Przeglad epidemiologiczny, v. 19, no. 3, 1965, 335-346

TOPIC TAGS: bacteriology, cytology, virus disease, bacterial antigen, diagnostic medicine, epidemiology

ABSTRACT: Samples from smallpox suspects were tested during the epidemic in Poland in 1963. Chorioallantoic membrane of chick embryos was used for isolation. Hyperplastic foci occurred as a result of infecting HeLa cells with small doses of the identified virus. The phenomenon is described in the literature as the differentiating agent between variola and vaccinia virus. Serum hemagglutinin levels obtained by the authors correspond to the results of McCarthy, Downie, Elizberg and Marennikowa. A high correlation existed between serum antigen levels and the clinical pattern of the disease. Antihemagglutinin levels corroborate the diagnosis of variola. In the event of clinical and bacteriological negative findings, this may serve as a basic diagnostic method. The authors thank Docent, Doctor T. Sporzynski for valuable comments and discussion of the results. Orig. art. has: 9 figures and 3 tables. /JPRS/

SUB CODE: 06/ SUBM DATE: none / ORIG REF: 003/ OTH REF: 024/ SOV REF: 001

Card 1/1 mc

KRESL, Jiri, inz., CSc.

Water conservation function of forests. Les cas 9 no. 12: 1135-1144 D '63.

1. Lesnicka fakulta, Vysoka skola zemedelska, Brno.

KRESL, Milan, inz.

Take care in operating an Avomet apparatus! Sdel tech 12 no.7:
278 Jl '64

BENDA, Petr, inz.; VALKOVA, Olga, inz.; KRESL, Milos

Testing the method of plant and seedling top dressing in forest nurseries. Les cas 10 no.10:869-878 O '64.

1. Institute of Scientific Management, Prague.

KRESLAVSKIY, B.F.

Mechanization of technological computations and designs at the State Institute for Design and Planning of Synthetic Fuel and Gas Plants. Khim. prom. no.7 517 Jl '61.
(MIRA 14:7)

(Chemical engineering)

KRESTIN, [illegible]

...sions on immunity. Zashch. rast. ot vred. i bol. 9 no.7:28 '64.
(MIRA 18:8)

1. Primorskiy filial Vsesoyuznogo instituta zashchity rasteniy.

CHENKIN, A.F.; KRESLIN', A.K. [Kreslins, A.]; KUZNETSOVA, Ye.D.

Information and brief news. Zashch.rast. ot vred. i bol. 9 no.11:54-61 '64. (MIRA 18:2)

KRESLIN, A. R.

Kreslin, A. R.

"The clinical aspects and prosthetics of both thighs amputated with the sockets." Second Moscow State Medical Inst imeni I. V. Stalin. Moscow, 1956. (Dissertation for the Degree of Candidate in Medical Science)

So: Knizhnaya letopis', No. 25, 1956.

KRESLIN', A.Ya. [Kreslins, A.], inzh. (Riga)

Selection of pumps for central conditioners. Vod. i san. tekh. no.11:19-23 N '63. (MIRA 17:1)

KRESLIN', A.Ya., inzh. [Kreslins, A.] (Riga)

Optimal conditions of air cooling in wet air conditioners.
Vod. i san. tekh. no.10:14-17 O '65. (MIRA 18:11)

KRESLIN', D. Ya., Candidate of Biol Sci (diss) -- "The specificity of local strains of azotobacter and their interaction with cultivated plants under the conditions of the Latvian SSR". Riga, 1959. 23 pp (Latvian State U im Petr Stuchka), 200 copies (KL, No 22, 1959, 112)

BAYTIN, Ayzik Abramovich, dots.; MOTOVILOV, German Petrovich; GERNITS, Osval'd Ottovich, dots.; BARANOV, Nikolay Ivanovich, dots., [deceased]; KRESLIN, Ernst Petrovich, dots.[deceased]. Prinimal uchastiye MOTOVILOV, M.P., prof.; ZAKHAROV, V.K., prof., retsenzent; GORYACHEV, I.V., red.; FUKS, Ye.A., red. izd-va; LOBANKOVA, R.Ye., tekhn. red.

[Forest management] Lesoustroistvo. [By] A.A.Baitin i dr. Izd.2., perer. i dop. Moskva, Goslesbumizdat, 1961. 283 p. (MIRA 15:3)

1. Belorusskiy lesotekhnicheskiy institut (for Zakharov).
(Forest management)

Kreslina, D.

Influence of agricultural plants upon development and activity of azotobacter. p.145

Latvijas PSR Zinatnu akademija. Mikrobiologijas instituts. TRUDY Riga, Latvia. No.8, 1959

Monthly List of East European Accessions (EEAI) LC, Vol.8, no.11 November 1959
Uncl.

KRESLINA, D.

Acclimatization possibilities and development of the local azotobacter stem in the rhizosphere of cultivated plants under laboratory conditions. Vestis Latv ak no.10:117-122 '60.
(KEAI 10:9:10)

1. Latvijas PSR Zinatnu akademija, Mikrobiologijas instituts.

(Azotobacter) (Soils) (Plants)

KRESLINA, C.A.

PA - 2529

AUTHOR: WINOGRADSKAJA,E.L., KRESLINA,C.A., ca,d tech.sc.

TITLE: The Influence Exercised by Chemical Composition on some Rules on the Occasion of Martensite Transformation. (Wlijanija chimtscheskogo sostawa na nekotoryie zakonomernosti martensitnych prewraschtschenij, Russian).

PERIODIACAL: Latvijas PSR Zinatnu Akad. Westis, 1957, Vol 1, Nr 2, pp 153 - 160, (U.S.S.R.)

Received: 5 / 1957 Reviewed: 6/1957

ABSTRACT: The investigations of transformations in the cast of colored metals led to completely changes conceptions concerning the nature of transformation from the -phase to the -phase. Anomalies can, compared to typical phase transformations, be explained by the fact that they occur as a result of low energy conditions of atomic thermal oscillations. The character of the transformation (cast) is shown by table 2. In order to determine the character of the "inverse" ( ) transition (corresponding to the "inverse" transformation) the samples were slowly heated (50^{o} min) in a liquid surrounding up to T-900^{o}, and were subjected to low-temperature cooling down to T = -194^{o}. Chemical composition exercises hardly any influence at all on the temperature of the domain of "inverse" transformation ( ). In order to determine structural stress (of the transitions) the casting

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PA - 2529

The Influence Exercised by Chemical Composition on some Rules on the Occasion of Martensite Transformations.

samples were subjected to cyclical treatment (table 1). Results of the investigation: Determination of the influence exercised by chemical composition on some "reversions" of the martensite which occur according to certain rules.

ASSOCIATION: Laboratory for Machine Technology
PRESENTED BY:
SUBMITTED:
AVAILABLE: Library of Congress.
Card 2/2

KRESLINA, G.A.

USSR/Solid State Physics - Phase Transformation in Solid Bodies E-5

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 972

Author : Vinogradskaya, Ye.L., Kreslina, G.A.

Inst : Laboratory of Machine Research, Academy of Sciences, Latvian SSR.

Title : Certain Laws of the Direct and Inverse Martensitic Transformation.

Orig Pub : Metallovedeniye i obrabotka metallov, 1957, No 5, 12-15

Abstract : A total hysteresis loop of the reversible $\gamma \rightleftarrows \alpha$ transformation is plotted. For the alloy investigated (an alloy with an iron base to which are added (in percent) 0.06 C, 13.2 Mn, 0.28 Cu, and 2.12 Co), the hysteresis of the start of the transition amounts to approximately 240°. It is established that the stabilization of the gamma phase depends essentially on the temperature to which the

Card 1/2

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 972

specimen is heated after the first $\gamma \rightarrow \alpha$ transformation. The maximum degree of stabilization in the second $\gamma \rightarrow \alpha$ transformation is reached only upon heating to a temperature corresponding to the end of the reversible $\alpha \rightarrow \gamma$ transition. It is assumed that the stabilization is due to the stresses in the gamma phase, occurring in the direct and subsequent inverse transformations. The stresses apparently "distort" the gamma phase, and are not relieved even in that case, when the α phase vanishes almost completely in the $\alpha \rightarrow \gamma$ transition.. These distorting stresses can be relived only by reheating the new-phase by 170 -- 200° above the temperature of its total formation, after which the ability of the gamma phase to undergo complete martensitic transformation is restored upon the subsequent cooling.

Card 2/2

KRESLING, Ya.M. (Leningrad)

Pathology of water balance in neuroses. Klin.med. 35 [i.e.34] no.1 Supplement:45 Ja '57. (MIRA 11:2)

1. Iz kliniki nevrozov Gosudarstvennog nauchno-issledovatel'skogo psikh-nevrologicheskogo instituta im. V.M.Bekhtereva (dir. i nauchnyy rukovod. - prof. V.M.Myasishchev)
(NEUROSES) (WATER IN THE BODY)

KRESLING, Yo.E., Cand Med Sci--(diss) "Clinico-experimental study of water metabolism in neurones." Len, 1958. 18 pp (Len State Order of Lenin Inst for the Advanced Training of Physicians im S.M.Kirov. State Sci Res Psycho-neurological Inst im V.M.Bekhterev), 200 copies (KL,45-58,152)

KRESLING, Ye.M.

Clinical and experimental investigation of water metabolism in neuroses. Sbor. trud. Len. nauchn. ob-va nevr. i psikh. no.6: 334-335 '59. (MIRA 13:12)

1. Iz kliniki nevrozov i pogranichnykh sostoyaniy Psikhonevrologicheskogo instituta imeni V.M. Bekhtereva (nauchnyy rukovoditel' otdeleniya i direktor instituta - chlen-korrespondent Akademii pedagogicheskikh nauk RSFSR, prof. V.N. Myasishchev).
(NEUROSES) (WATER IN THE BODY)

YAKOVLEVA, Ye.K.; BASKINA, N.F.; BOBROVSKAYA, M.N.; KRESLING, Ye.M.; MYAGER, V.K.; SHKLYAROVA, E.D.; NIKOLAYEVA, K.N.

Use of hemohormonestimulin in the clinical aspects of neuroses. Akt. vop.perel.krovi no.7:195-198 '59. (MIRA 13:1)

1. Klinika nevrozov i pogranichnykh sostoyaniy Gos.psikhonevrologicheskogo nauchno-issledovatel'skogo instituta imeni V.M. Bekhtereva (direktor i nauchnyy rukovoditel' - chlen-korrespondent AMN SSSR prof. V.N. Myasishchev).
(HORMONES, SEX) (NEUROSES)

AGEYEVA, A.N.; KRESLING, Ye.M.; MIL'CHENKO, V.A.

Mental disorders in Itsenko-Cushing disease. Vop.psikh.i nevr. no.7:341-349 '61. (MIRA 15:8)

1. Iz Gosudarstvennogo nauchno-issledovatel'skogo psikhonevrologicheskogo instituta imeni V.M.Bekhtereva (dir. - chlen-korrespondent Akademii pedagogicheskikh nauk RSFSR prof. V.N.Myasishchev) i psikhiatricheskoy kliniki Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta (zav. kafedroy - prof. V.K.Fedorov).
(CUSHING SYNDROME) (MENTAL ILLNESS)

YAKOVLEVA, Ye.K.; BOBROVSKAYA, M.N.; KRESLING, Ye.M.; MYAGER, V.K.

Trioxazine therapy in the clinic for neuroses. Zhur.nevr.i psikh. 62 no.8:1225-1227 Ag '62. (MIRA 15:12)

1. Klinika nevrozov i pogranichnykh sostoyaniy (zav. - doktor meditsinskikh nauk Ye.K.Yakovleva) Nauchno-issledovatel'skogo psikhonevrologicheskogo instituta imeni V.M.Bekhtereva (dir. - kand.med.nauk B.A.Lebedev), Leningrad.
(NEUROSES) (OXAZINE)

KRESLINS, A.

Experience of front-rankers in raising corn on collective farms to be used more widely. p. 27. PADOMJU LATVIJAS KOMUNISTS, Riga. Vol. 11, no. 3, Mar. 1956.

SOURCE: East European Acession List (EEAL) Library of Congress Vol. 5, no. 8, August 1956.

KRESLIN'SH, E.K.

KNORRING, G.M., kandidat tekhnicheskikh nauk; BELYAKOV, A.A.; KRESLIN'SH, E.K., knzhenér; SHERMAZANYAN, Ya.T.; LEYBOVICH, D.S.

Use of PPv wires. Prom.energ. 11 no.12:22-25 D '56. (MLRA 10:1)

1. Gosudarstvennyy proyektnyy institut Tyazhpromelektroproyekt (for Knorring).2. Gor'kovskoye otdeleniye Gosudarstvennogo proyektnogo instituta Elektroproyekt (for Belyakov). 3. Energosbyt Latvenergo (for Kreslin'sh). 4. Respublikanskiy proyektnyy institut, Yerevan (for Shermazanyan). 5. Trest "Moselektromontazh-2" (for Leybovich).
(Electric wire, Insulated)

KRESNIN, A.A.

Generalized nuclear model and some problems in β -decay theory. (MIRA 16:8)
Ukr. fiz. zhur. 8 no.4:426-430 Ap '63.

1. Fiziko-tekhnicheskiy institut AN UkrSSR, Khar'kov.
(Nuclear models) (Beta rays—Decay)

KRESNIK, Vladimir

Myrtillin in differentiation of deoxy- and ribonucleic acids; preliminary communication. Zdrav.vest., Ljubljana 24 no.4:139-142 1954.

1. Patolosko-anatomski institut v Ljubljani-predstojnik: prof. dr. France Hribar.
(NUCLEIC ACID, determination,
myrtillin in differentiation of deoxy- & ribonucleic acids)

KRESNIK, Vlado

Pneumocystic interstitial pneumonia of newborn. Zdrav. vest., Ljubljana 24 no.7-8:239-241 1955.

1. Patolosko-anatomski institut v Ljubljani-predstojnik: prof. dr. France Hribar.

(PROTOZOA
Pneumocystis carinii, staining with myrtillin (Sl))
(STAINS AND STAINING
myrtillin for Pneumocystis carinii (Sl))
(PNEUMONIA, in inf. & child
interstitial plasma cell pneumonia of newborn, staining of Pneumocystis carinii with myrtillin (Sl))

S

CZECHOSLOVAKIA / Human and Animal Morphology - Digestive Tract.

Abs Jour : Ref. Zhur. - Biol., No. 22, 1958, No. 101402

Author : Kresnik, V.
Inst : -
Title : The Cytoplasmic Structure of the Squamous Epithelium of the Tongue.

Orig Pub : Zdravstv. vestn., 1957, Vo. 26, No. 4, 155-157

Abstract : In studies of the epithelium of the tongue with the aid of phase-contrast microscopy and different histologic and histochemical methods, it was possible to demonstrate in many cells small formations which seemed to be penetrating into the cytoplasm from the nucleus. It is probable that these formations were processes of the nucleus, since they were completed covered by the nuclear

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CZECHOSLOVAKIA / Human and Animal Morphology - Digestive Tract

Abs Jour : Ref. Zhur. - Biol., No. 22, 1958, No. 101402

membrane. In some of the cells there were granular and sperical bodies which were distributed in the cytoplasm about the nucleus; in dimensions these formations were smaller than cocci and did not stain with Janus green. The author believes that these bodies arise as the result of hyperfunction of the mitochondria and intensification of metabolism of the nucleoproteins of the protoplasm. -- A. I. Ivanov

Card 2/2

KRESNIK, V.

A simplified method of performing the Feulogen Nuclear and Periodic-Acid Schiff reactions. Acta med. iugosl. 14 no.2:132-139 '60.

1. Virus Laboratory of the Central Institute of Hygiene, Ljubljana.
(NUCLEIC ACIDS chem)
(PERIODIC ACIDS)

KRESNIK, V.; JUNG, M.

Cytological and cytochemical study of human amnion cells infected with virulent and attenuated strains of type 1 poliovirus. Acta med. iugosl. 15 no.4:446-462 '61.

1. Institute of Patho-Anatomy, Medical Faculty, University of Ljubljana and Virus Laboratory, Department of Epidemiology, National Institute of Health Ljubljana.
(POLIOMYELITIS VIRUS culture) (TISSUE CULTURE)

KRESNIK, Vladimir

Morphogenesis of pulmonary carcinoma. Tuberkuloza 17 no.1/2[illegible]
Ja-Ap'65.

1. Patoloskoanatomski Institut, Ljubljana.

AUTHOR KRESNIN, A.A., ROZENTSVEYG, L.N. PA-2684

TITLE Polarization Effects in the Scattering of Electrons and Positrons by Electrons.
(Polarisatsionyye effekty pro ras seyanii elektronov i pozitronov na elektronakh - Russian)

PERIODICAL Zhurnal Eksperim. i Teoret.Fiziki, 1957, Vol.32, No.2, pp. 353-358 (U.S.S.R.)

Received 5/1957 Reviewed 6/1957

ABSTRACT In the second perturbation theoretical approximation, which leads to the well-known formula by Møller, the scattering of an unpolarized bundle by an unpolirized target leaves the bundle unpolarized. In the scattering of a polarized bundle by an unpolarized target (or of an unpolirized bundle by a polarized target) there occurs no azimuthal asymmetry. These effects appear only in the third perturbation theoretical approximation which yields the radiation corrections for the formula by Møller. But also in the second perturbation theoretical approximation we have the following phenomena:(1) In scattering by a polarized target (magnetized ferromagneticum) the electron bundle is polarized. (2) In scattering of a polarized bundle by a polarized target the angular distribution deviates from the Møller distribution. (We have there a different dependence on the angle and we also have an azimuthal asymmetry). Unlike the scattering of electrons in the Coulomb field of a nucleus, these effects do not disappear in the boundary cases with nonrelativistic or extremely relativistic energy. The intensity of these effects is about the same in positrons and in electrons. (By the way, these effects do not occur with

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Polarization Effects in the Scattering of Electrons and Positrons by Electrons. PA - 2684

positrons at nonrelativistic energies). The existence of a longitudinal polarization in the incident bundle is directly noticeable at the scattering. The registration of the coincidences caused by the scattered electron (positron) and by the recoil electron permits us to eliminate completely the influence of the twofold scattering in the foil. These properties of the Møller scattering in magnetized foils direct attention to a new method for the analysis of new electron and positron bundles. In some cases this new method is rather advantageous. The paper under review gives, step by step, the computations which belong to the lines of thought just indicated.
(4 reproductions).

ASSOCIATION Physical-Technological Institute, Academy of Sciences of the Ukrainian SSSR.
PRESENTED BY
SUBMITTED 8.12.1955
AVAILABLE Library of Congress
Card 2/2

KRESNIN, A.A.

AUTHOR VYSOTSKIY, G.L., KRESNIN, A.A., ROZENTSVEYG, L.N. 56-5-17/55

TITLE The Deceleration Radiation of Polarized Electrons. (Tormoznoye izlucheniye polyarizovannykh elektronov.- Russian)

PERIODICAL Zhurnal Eksperim. i Teoret. Fiziki 1957, Vol 32, Nr 5, pp 1078-1082 (USSR)

ABSTRACT The paper under review investigates the polarizing properties od deceleration radiation for the case that the electron bundle falling upon the particle is polarized. The authors describe the polarizing properties of the photon bundle by the density matrix

$$\varrho_0 = (1/2)(1 + \{ \vec{\Omega}), \text{ with } \vec{\Omega} \text{ denoting a}$$

"matrix vector" with the components

$$\Omega_1 = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}, \quad \Omega_2 = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}, \quad \Omega_3 = \begin{pmatrix} 0 & -i \\ i & 0 \end{pmatrix}.$$

$\{_1, \{_2, \{_3$ are the Stokes parameters. In this context, the

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56-5-17/55

The Deceleration Radiation of Polarized Electrons(Tormoznoye izlucheniye polyarizovannykh elektronov.- Russian)

vectorial way of writing of $\vec{\xi}$ has only formal significance. First of all, the paper under review lists an equation for the determination of the parameters

$$\xi_i$$

for the case that the incoming electron bundle is not polarized. In this case, the deceleration radiation is linearly polarized.

The state of polarisation of the electrons with the impulse p_o is described by a four-row density matrix. Also for the case of a polarized electron bundle expressions for the Stokes parameters of the deceleration radiation are derived. The deceleration radiation has no influence whatsoever on the cross section of the deceleration radiation as computed in Born's approximation. In the boundary case of extremely relativistic energies, the effects of the screening have to be taken into account. The course of the computations is followed ste by step, and the (rather lengthy) expressions obtained are written in their explicit form. A diagram gives a clear picture of the

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56-5-17/55

The Deceleration Radiation of Polarized Electrons.

circular polarization of the deceleration radiation of the extremely relativistic electrons.
(1 reproduction)

ASSOCIATION: Physical-Technological Institute, Academy of Sciences of the Ukrainian SSR.
PRESENTED BY: -
SUBMITTED: 3.5. 1956.
AVAILABLE: Library of Congress.

CARD 3/3

VYSOTSKIY, G.L. [Vysots'kyi, H.L.]; KRESNIN, A.A.

Theory of bremsstrahlung of electrons by protons. Ukr. fiz. zhur. 4 no.2:164-166 Mr-Ap '59. (MIRA 13:1)

1.Fiziko-tekhnicheskiy institut AN USSR.
(Bremsstrahlung) (Electrons) (Protons)

VYSOTSKIY, G.L. [Vysots'kyi, H.L.]; KRESNIN, A.A.; TISHCHENKO, B.I. [Tyshchenko, B.I.]

Focusing properties of an achromatic parallel-beam translation system. Ukr.fiz.zhur. 4 no.4:428-431 Jl-Ag '59. (MIRA 13:4)

1. Fiziko-tekhnicheskiy institut AN USSR.
(Electron optics)

24(5)

AUTHORS: Vysotskiy, G. L., Inopin, Ye. V., Kresnin, A. A.

SOV/56-36-2-33/63

TITLE: The Scattering of Neutrons by Oriented Nonspherical Nuclei (Rasseyaniye neytronov oriyentirovannymi nesfericheskimi yadrami)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 2, pp 574-580 (USSR)

ABSTRACT: In earlier papers (S. I. Drozdov, Inopin, Refs 1-3) the influence exercised by the nonsphericity of nuclei on total cross section in neutron scattering was investigated. At neutron energies of some tens of Mev the total neutron cross section varies as a result of nonsphericity by 2-3% in the case of experimentally observable nonsphericity. The nucleus is considered to be an ellipsoid with the semiaxes a and b; a is assumed to lie in the same direction as the symmetry axis of the nucleus. If the direction of the symmetry axis coincides with the incident neutron beam, $\sigma_t^{\parallel} = 2\pi b^2$; if the symmetry axis is vertical to the inciding beam, then $\sigma_t^{\perp} = 2\pi ab$ ($\sigma_t^{\perp}/\sigma_t^{\parallel} = a/b$) and, correspondingly $\sigma_t^{\perp}/\sigma_t^{\parallel} > 1$ or

The Scattering of Neutrons by Oriented Nonspherical Nuclei

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$\sigma_t^{\perp}/\sigma_t^{\parallel} < 1$. a/b values of 1.3-1.4 were found experimentally, which would correspond to a nonsphericity effect of 30-40%. This value, of course, is based on the assumption of a complete orientation of nuclear spins, which cannot be realized in practice. In the case of incomplete orientation the symmetry axis performs a precise motion round the direction of spin, which is to be neglected only in the case of very large spins, i.e. in the quasiclassical case. The authors investigate these conditions and calculate the total cross section and neutron angular distribution in neutron scattering on oriented nonspherical nuclei by using adiabatic approximation (cf.Refs 1-3); this is justified in the case of neutron energies of more than several Mev. Concrete examples are calculated by means of the black nucleus model; results therefore hold good only for the neutron energy range of several tens of Mev. Results show that the nonsphericity effects are more appreciable in oriented than in nonoriented nuclei. The angular distribution of neutrons scattered on oriented nonspherical nuclei shows noticeably azimuthal

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asymmetry (Figs 3,4). A table contains the formulae for $\bar{\sigma}(f_k)/\bar{\sigma}(0)$ for spin values between 1 and 7/2. There are 4 figures, 1 table, and 8 references, 6 of which are Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR (Physico-Technical Institute of the Academy of Sciences, Ukr SSR)

SUBMITTED: August 23, 1958

AUTHOR: Kresnin, A. A. SOV/56-37-3-51/62

TITLE: On Electron Polarization in Bremsstrahlung

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 37, Nr 3(9), pp 872-873 (USSR)

ABSTRACT: The polarization effects in the bremsstrahlung of electrons have already been investigated in some previous papers. Nevertheless, the problem of the variation in polarization of an electron beam due to bremsstrahlung has practically not yet been investigated. The author investigates this problem by the method of F. W. Lipps and H. A. Tolhoek (Ref 4) as well as of A. A. Kresnin and L. N. Rozentsveyg (Ref 5). In this connection he defines the polarization state of the incident electrons with the momentum p_1 by the density matrix $\varrho(\vec{\zeta}_1 \vec{p}_1) = \eta^{(+)}(\vec{p}_1)\frac{1}{2}(1 + \vec{\zeta}\Sigma\gamma_4)\eta^{(+)}(\vec{p}_1)$ with $\eta^{(+)}(\vec{p}) = (m - i\hat{p})\gamma_4/2\varepsilon$, $\Sigma = i\gamma\gamma_4\gamma_5$. The vector $\vec{\zeta}$ characterizing the polarization of an electron in the laboratory system is connected with the polarization vector $\vec{\zeta}^0$ in that coordinate system in which the electron is at rest by the

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relation $\vec{\zeta}^{o} = \vec{\zeta} - \vec{p}\,(\vec{\zeta}\,\vec{p})/\varepsilon(\varepsilon + m)$, where ε denotes the energy of the electron. A formula for the vector $\vec{\zeta}_2$ is then given which defines the polarization state of those electrons which emitted a quantum: $\vec{\zeta}_2 = Sp\left[\Sigma\eta^{(+)}(\vec{p}_2)S\eta^{(+)}(\vec{p}_1)\rho(\vec{\zeta}_1,\vec{p}_1)\eta^{(+)}(\vec{p}_1)S^{+}\right.$ $\left.\eta^{(+)}(\vec{p}_2)\right] / Q$. S denotes the element of the scattering matrix for the process of bremsstrahlung. $\vec{k}$ and ω denote the wave vector and the energy of the emitted photon; indices 1 and 2 refer to the initial and the final state of the electron. The resultant very extensive expressions for $Q\vec{\zeta}_2$ and Q are explicitly written down. The expression for Q agrees, except for one factor, with the cross section of bremsstrahlung computed by the formula of Bethe-Heitler. In some special cases the expression for $Q\vec{\zeta}_2$ may be considerably reduced. In the non-relativistic limiting case $\vec{\zeta}^{o}_2 = \vec{\zeta}^{o}_1$ is obtained, i.e. the polarization character of the beam does not change. In the

limiting case of extremely soft quanta of the bremsstrahlung ($\omega \to 0$) it holds that $\vec{\zeta}_2 = \vec{\zeta}_1 + \frac{(\vec{\zeta}_1, \vec{p}_1+\vec{p}_2)}{m^2+\varepsilon^2+\vec{p}_1\vec{p}_2}(\vec{p}_2-\vec{p}_1)$.

The vector $\vec{\zeta}_2^{\,o}$ rotates, without changing its absolute amount, by a certain angle φ around the line perpendicular to the plane $\vec{p}_1$, $\vec{p}_2$. There are 5 references, 2 of which are Soviet.

SUBMITTED: June 5, 1959

S/185/60/005/002/001/022
D274/D304

AUTHOR: Kresnin, A.A.

TITLE: Polarization of gamma-quanta ir bremsstrahlung of electrons on protons

PERIODICAL: Ukrayins'kyy fizychnyy zhurnal, v. 5, no. 2, 1960, 137-140

TEXT: The effect of proton recoil on the polarization of γ-quanta is considered, the investigation being confined to the case of unpolarized incident electrons. Formulas are obtained for the Stokes parameters ξ_1 and ξ_2 which characterize the polarization; the corrections due to recoil, contained in these formulas are significant with large angles and large enough momenta of proton recoil. For describing the polarization of electrons and γ-quanta, the method of density matrices is used, developed by F.W. Lipps and H.A. Tolhoek (Ref. 3: Physica, 20, 85, 1954), and by A.A. Kresnin and L.N. Rozentsveyg (Ref. 4: ZhETF, 32, 353, 1957). To an unpolarised electron beam corresponds the density matrix

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Polarization of gamma-quanta...

$$\rho_e = \frac{1}{2}\eta^{(+)}(p_o) \qquad (1)$$

where $\eta^{(+)}(p_o)$ is the projection operator (onto the postive-energy state). Photon-polarization is described by the density matrix

$$\rho_\rho = \frac{1}{2}(1 + \xi_i \Omega_i) \qquad (2)$$

where

$$\Omega_1 = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}, \Omega_2 = \begin{pmatrix} 0 & 1 \\ 1 & 0 \end{pmatrix}, \quad \Omega_3 = \begin{pmatrix} 0 & -i \\ i & 0 \end{pmatrix} \qquad (3)$$

where ξ_i are the Stokes parameters. It is assumed that these parameters are not vectors. The Stokes parameters of the bremsstrahlung are

$$\xi_i = (\Omega_i)_{\lambda'\lambda''} \frac{Sp(S_{\lambda'} S^+_{\lambda''})}{Sp(S_\lambda S^+_\lambda)} \qquad (4)$$

where $S\lambda$ is an element of the scattering matrix corresponding to a γ-quantum with polarization vector $e\lambda$ ($\lambda = 1,2$). Denoting Sp by Q, formula (4) is written

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Polarization of gamma-quanta...

$$\xi_i = (\Omega_i)_{\lambda'\lambda''} \frac{Q_{\lambda''\lambda'}}{Q} \qquad (7)$$

After expanding in series in terms of the ratio q/M, (q being the momentum of proton recoil and M the proton mass), the author obtains

$$Q = \frac{1}{q^4} A + \frac{2m^2}{q^2(q_1^2-\omega^2)M\omega}(B-C), \qquad (11)$$

where

$$A = \frac{4\varepsilon_0^2 - q^2\left(1+\frac{2\varepsilon_0}{M}\right)}{\varkappa_0^2}[pk]^2 + \frac{4\varepsilon^2 - q^2\left(1-\frac{2\varepsilon}{M}\right)}{\varkappa^2}[p_0k]^2 +$$

$$+2\frac{4\varepsilon_0\varepsilon - q^2\left(1-\frac{\omega}{M}\right)}{\varkappa_0\varkappa}[p_0k][pk] - \frac{2\omega^2}{\varkappa_0\varkappa}[q_1k]^2,$$

$$B = \frac{m^2}{4}\left\{\left(1-2\frac{\mu}{\varkappa}\right)[p_0k][q_1k] + \left(1-2\frac{\mu_0}{\varkappa_0}\right)[pk][q_1k]\right\},$$

$$C = \omega\left|\frac{2\varepsilon_0[pk]^2 - \varepsilon[pk][q_1k]}{\varkappa_0} + \frac{2\varepsilon[p_0k]^2 + \varepsilon_0[p_0k][q_1k]}{\varkappa}\right|.$$

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